September 2014

Message from the Astrophysics Division Director

As we approach the end of the 2014 fiscal year, it is time to reflect on our achievements and shortcomings, and plan for challenges ahead. We have been extremely fortunate that our space-based missions, both large and small, have continued to make headlines with spectacular scientific discoveries that capture the mind of the public. We have learnt more about the way the universe works, have studied the birth of stars and galaxies, and have made great strides in discovering and understanding exoplanets.

As I described during the NASA Town Hall at the American Astronomical Society meeting in Boston on June 2, 2014, we continue to make progress addressing the priorities of the 2010 Decadal Survey for Astronomy and Astrophysics. The appropriation that NASA Astrophysics received for FY 2014 and the Administration's FY 2015 budget request both support our plans for continued progress. The progress we are making toward the major recommendations of the 2010 Decadal Survey includes:

- A goal of the Astrophysics Division is to be prepared to start a new strategic NASA Astrophysics mission to follow JWST as soon as funding becomes available. Preformulation and focused technology development for a 2.4m version of the Wide-Field Infrared Survey Telescope (WFIRST), a mission concept referred to as the Astrophysics Focused Telescope Assets (AFTA), are underway. NASA received $56M in directed funding for in FY 2014 for WFIRST/AFTA to continue preformulation activities and technology development. A recent National Research Council (NRC) study on WFIRST/AFTA offers a positive view of WFIRST/AFTA in the context of the Decadal Survey with concerns about technology and cost risks. The Administration's FY 2015 budget request supports an Agency/Administration decision for formulation of WFIRST/AFTA to begin no earlier than FY 2017, should funding be available.
- A new ROSES element, WFIRST Preparatory Science, was announced on April 21, with a goal to bridge from basic theory to observational modeling for WFIRST/AFTA; and more than 50 proposals were received on July 11. Investigators selected will coordinate efforts with the WFIRST Study Office and the WFIRST/AFTA Science Definition Team.
- The Administration's FY 2015 budget request includes augmentation of the Explorer program to enable more frequent flight opportunities, including a SMEX AO released on September 17 (see the AO at http://nspires.nasaprs.com/ and the additional information page at http://explorers.larc.nasa.gov/APSMEX/) and a MIDEX around FY 2017.
- Strategic technology investments are being made and partnerships are being discussed with the European Space Agency in their gravitational wave and X-ray observatories. NASA has joined ESA in supporting the ESA Science Study Team for the recently selected mission concept, "Advanced Telescope for High-ENergy Astrophysics" (ATHENA).

- Strategic technology investments are being made to advance the medium scale programs including technology for exoplanet missions and technology for detection of polarization of the cosmic microwave background.
- Modest augmentations have been made to small programs including R&A.

The FY 2014 appropriation for NASA provided $658M for JWST and $668M for the rest of NASA astrophysics. The FY 2015 Administration's budget request would provide $645M for JWST and $607M for the rest of NASA astrophysics. Both budgets support the continued development of JWST on plan toward its launch in 2018, and both budgets include funding for continued preformulation of WFIRST as described above. Both budgets also includes funding for several new missions including the Transiting Exoplanet Survey Satellite (TESS), the Neutron Star Interior Explorer (NICER), the next Astrophysics SMEX mission, the next Astrophysics Explorer Mission of Opportunity, and the NASA contribution to the European Space Agency's Euclid mission.

The Administration's FY 2015 budget proposes to place SOFIA into storage by FY 2015 unless partners are able to support the U.S. portion of SOFIA costs. The NASA appropriation subcommittees in both houses of Congress, however, have proposed continued funding for SOFIA at a level sufficient to continue operations. NASA has continued to conduct the SOFIA program as planned during FY 2014.

Other program highlights since my last Newsletter include:

- SOFIA formally entered the Operations Phase in May. Second generation instruments, HAWC+ (U.S.), and upGREAT (German) are under development. In late June, SOFIA was flown to Germany for a Heavy Maintenance Visit.
- Astrophysics research funding remains flat, retaining the growth realized since the Decadal Survey, with the success rate of proposals hovering between 15%-24%. This is caused by a sharp increase in the number of proposals received.
- A Senior Review of operating missions was conducted in April. At that time, all operating missions other than Spitzer were approved for continued operation. A full report of the Senior Review may be found at http://science.nasa.gov/astrophysics/2014-senior-review-operating-missions/.
- In July, the Science Mission Directorate made the decision to extend Spitzer operations for the next two years. The Spitzer observatory is an important resource for on-going infrared observations for research programs across the Science Mission Directorate, and, subject to the availability of Congressional appropriations in FY 2015, it will be continued.
- Astrophysics approved some funds for education activities in FY2014 and has continued a limited number of high impact activities.

Major activities planned for FY 2015 include confirmation of the TESS Explorer mission, launch of the ISS-CREAM experiment to the Space Station, Step 1 selection of the next Small Astrophysics Explorer and Explorer Mission of Opportunity Phase A studies, launch of ESA's LISA Pathfinder with NASA's ST-7, completion of the WFIRST/AFTA science definition team report, conduct of the Astrophysics Archives Senior Review, start

of the NRC Mid-Decade Review, and celebration of twenty five years of operation of the Hubble Space Telescope. All Astrophysics programs flow from the recently completed *NASA 2014 Science Plan,* which is available at http://science.nasa.gov/about-us/science-strategy/.

My entire presentation to the American Astronomical Society meeting is available at http://science.nasa.gov/astrophysics/documents/.

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